Morrison

DINOSAURS!

DISCOVER THE GIANTS OF THE PREHISTORIC WORLD

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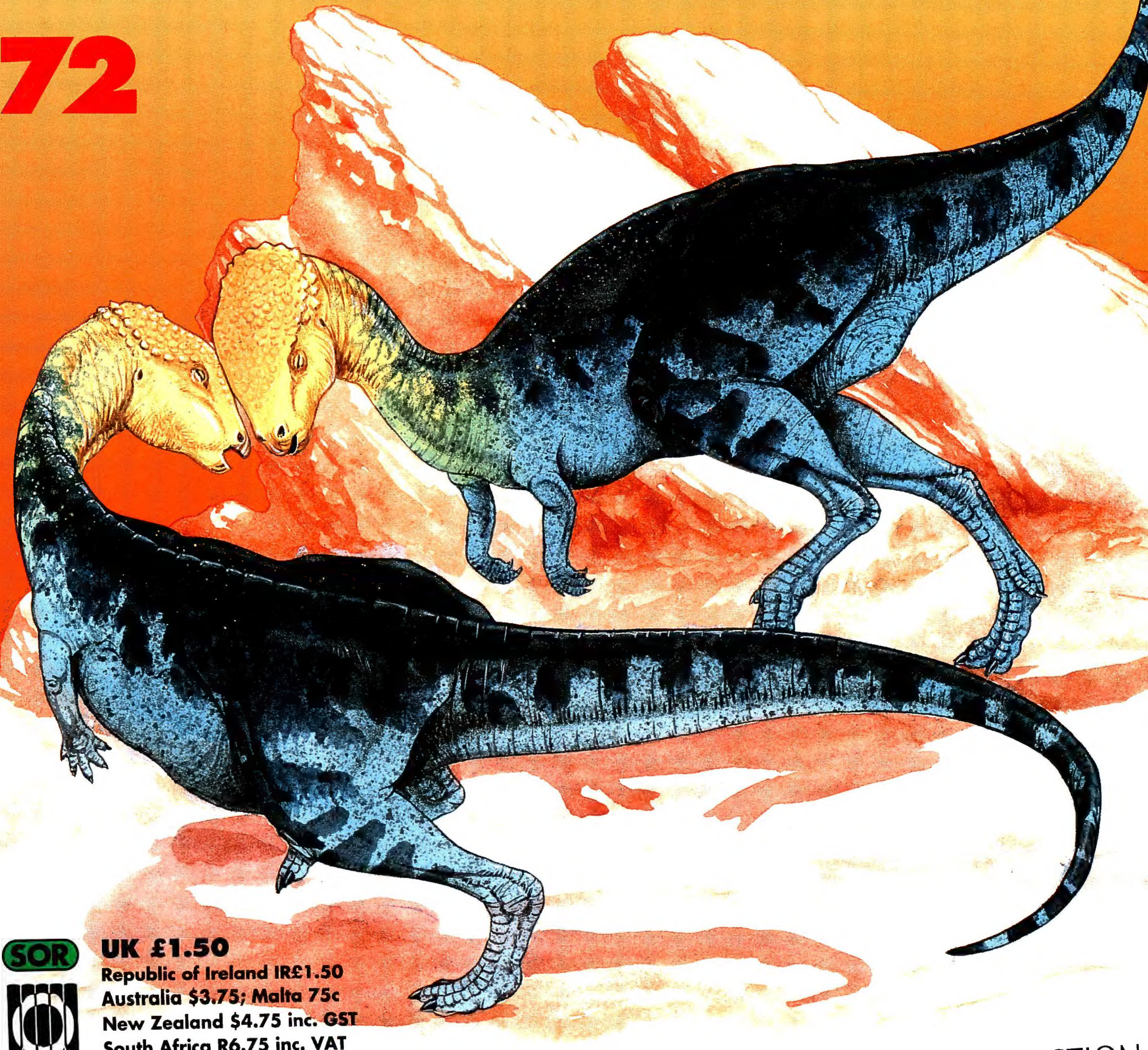

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

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MEGATHERIUM

***Megatherium* was a giant ground sloth with long, twisted claws.**

Imagine a bear as big as an elephant and you will have some idea what *Megatherium* looked like. This huge ground sloth was very different from the tree sloths that hang from branches today. If *Megatherium* had tried to hang from a branch, it would have brought the tree crashing down!

GOOD PICTURE

Many complete skeletons of *Megatherium* have been discovered and so experts have a good idea of its size and shape. Scientists were first able to examine fossils in the 18th century when a specimen was sent from Argentina to Spain.

GENTLE GIANT

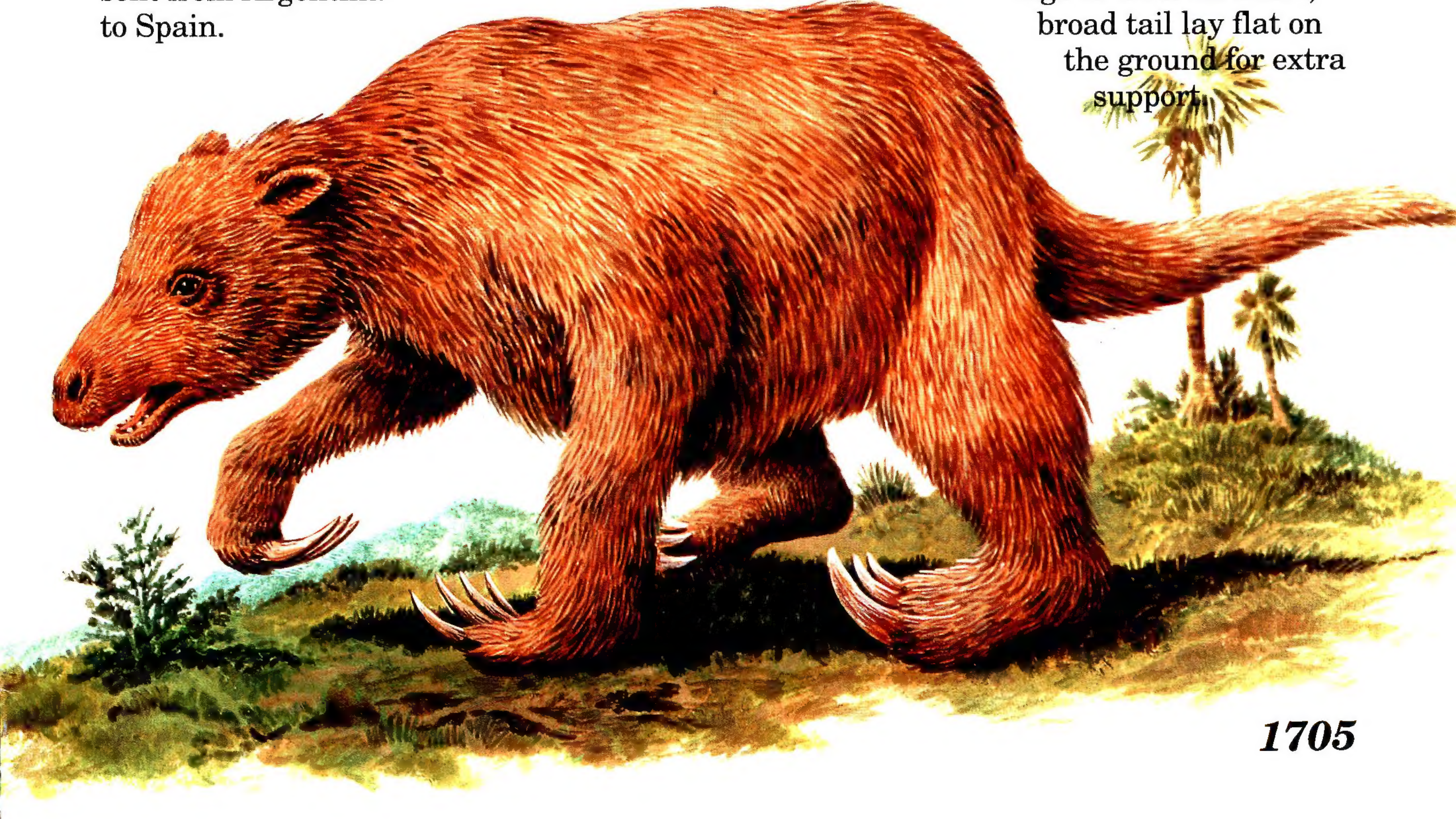
At first glance, *Megatherium*'s long curved claws look very frightening. But the plant-eating ground sloth was not a hunter. It used its claws to pull down branches and gather together bundles of leaves to eat.

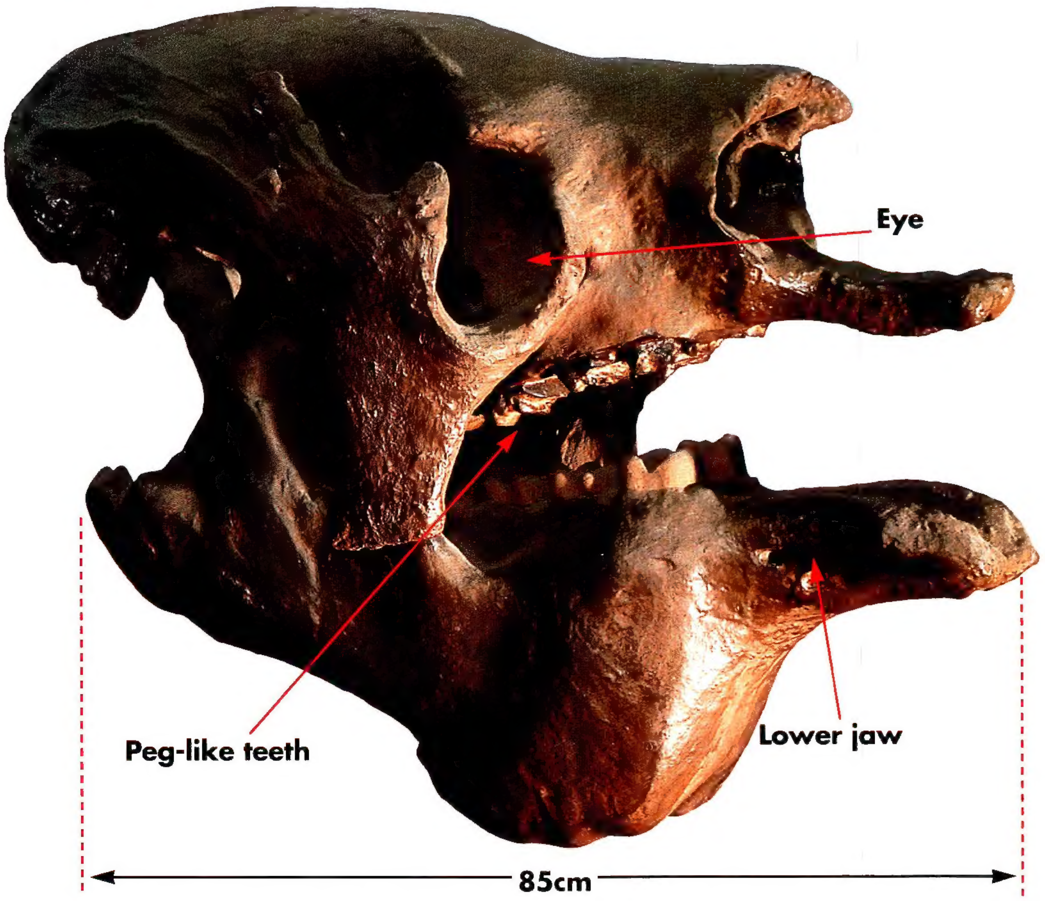
SIDE STEP

The shape of its claws made walking difficult for mighty *Megatherium.* As it trundled along on its four powerful legs, it was not able to put its feet flat against the ground. It walked on its knuckles and the sides of its feet instead.

HEFTY HIPS

Megatherium's wide hips and chunky legs made it 'bottom heavy' so the mammal could rear back on its hind legs to feed. Its short, broad tail lay flat on the ground for extra support.





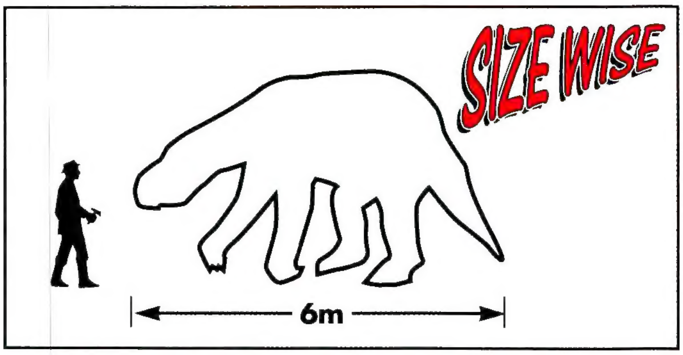
In 1789 the governor of Buenos Aires in South America sent to Madrid a complete fossilized skeleton of a strange, giant beast. The skeleton was intended to be displayed as a curiosity. A few years later the French palaeontologist Baron Georges Cuvier examined the skeleton and described it as the remains of a giant sloth.

BABY CARRIER

As the Earth's climate gradually cooled over thousands of years, many animals adapted to cope with the cold. *Megatherium* had a woolly coat to keep it warm. The long fur also provided a nifty way for *Megatherium* mothers to carry their young. As the ground sloth stood browsing among the treetops, a baby *Megatherium* probably kept safe and warm by clinging tightly to the long fur on its mother's chest or back.

FENCED IN

Experts think that early people may have been able to trap *Megatherium* and keep them in caves behind tall fences. The beasts would be well-fed in summer when leaves and grass were plentiful and easy to find. But when winter came, and food became scarce, the *Megatherium* were probably killed, cooked and eaten by hungry humans.

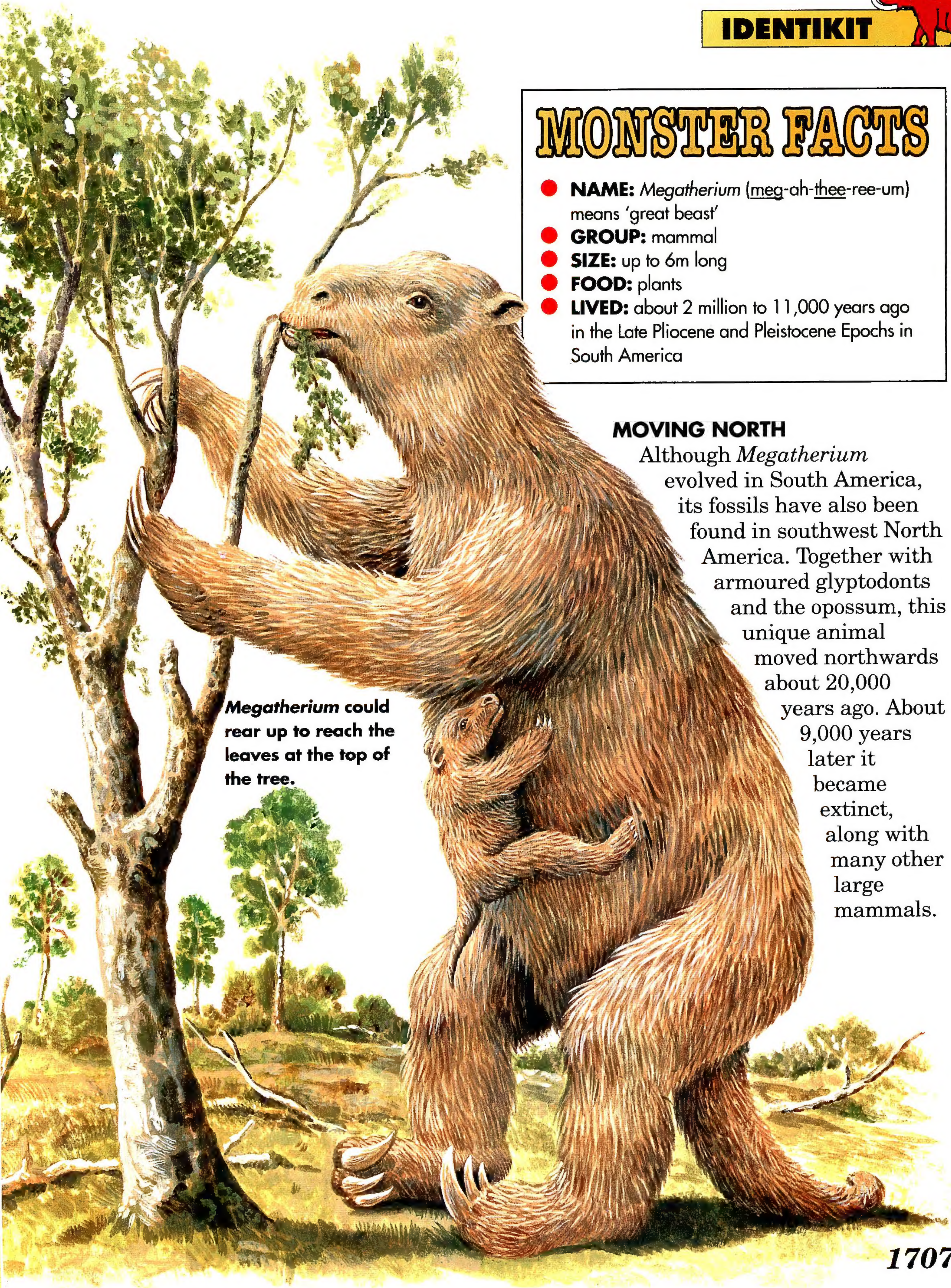


IT'S A FACT

The tree sloth of today is the slowest mammal. It moves very slowly and cautiously from tree to tree and can only crawl along on its side when on the ground. It takes the sluggish sloth six and a half hours to travel 1km!

MONSTER FACTS

- **NAME:** *Megatherium* (meg-ah-thee-ree-um) means 'great beast'
- **GROUP:** mammal
- **SIZE:** up to 6m long
- **FOOD:** plants
- **LIVED:** about 2 million to 11,000 years ago in the Late Pliocene and Pleistocene Epochs in South America



***Megatherium* could rear up to reach the leaves at the top of the tree.**

MOVING NORTH

Although *Megatherium* evolved in South America, its fossils have also been found in southwest North America. Together with armoured glyptodonts and the opossum, this unique animal moved northwards about 20,000 years ago. About 9,000 years later it became extinct, along with many other large mammals.

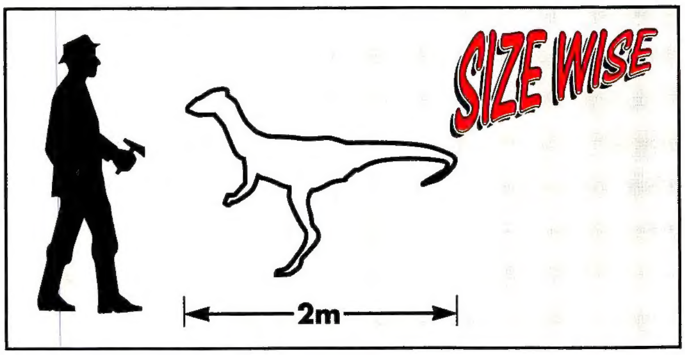
GOYOCEPHALE

***Goyocephale* used its knobbly head to push against a rival's bony skull.**

This bone-headed dinosaur was about as long as a large wolf. Only parts of its skull and some pieces of skeleton have been found in Mongolia, but these are enough to show experts that it belonged to a group of low-domed pachycephalosaurids which includes *Homalocephale* and *Yaverlandia*.

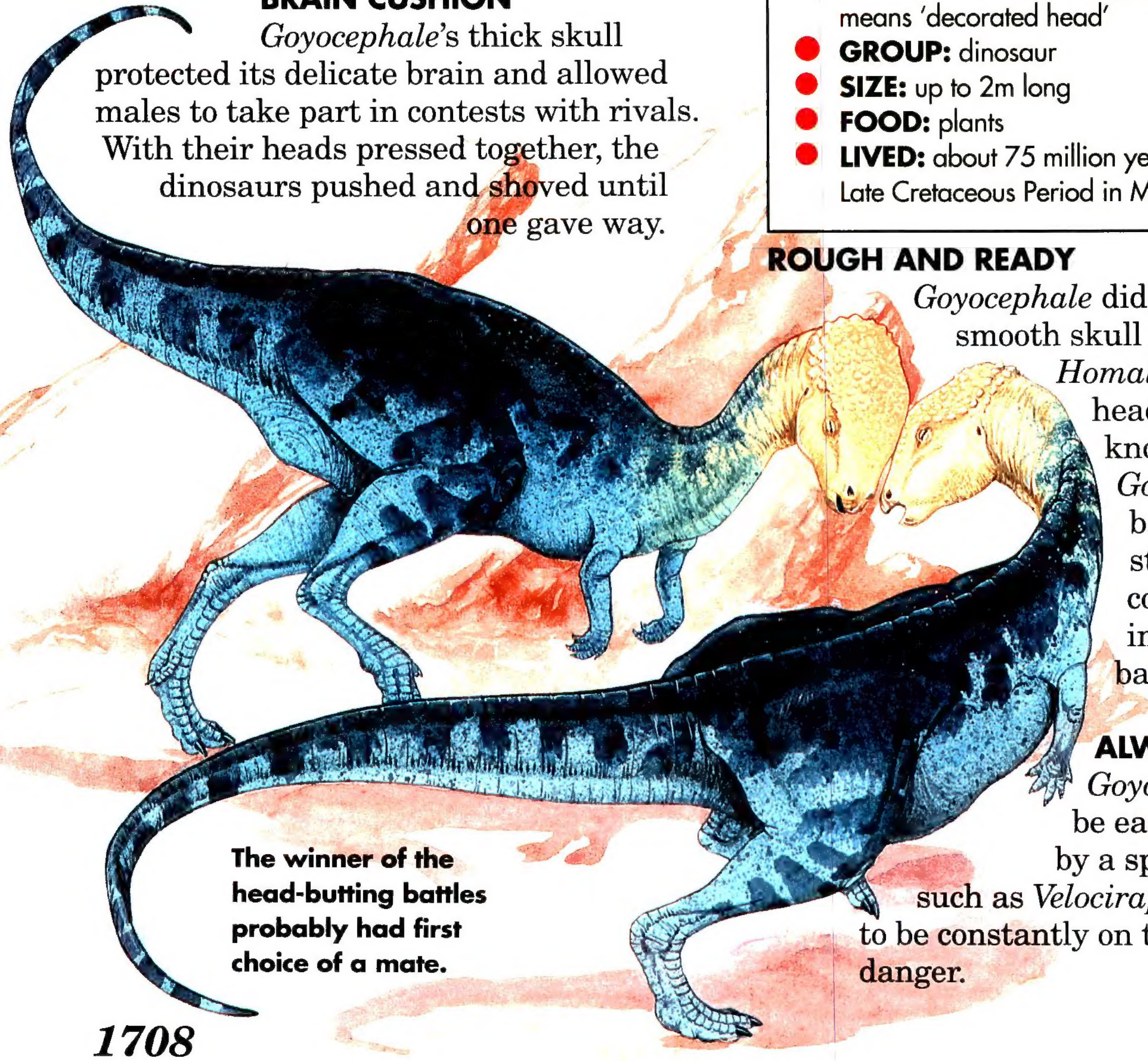
BRAIN CUSHION

Goyocephale's thick skull protected its delicate brain and allowed males to take part in contests with rivals. With their heads pressed together, the dinosaurs pushed and shoved until one gave way.



MONSTER FACTS

- **NAME:** *Goyocephale* (goy-oh-kef-a-lee) means 'decorated head'
- **GROUP:** dinosaur
- **SIZE:** up to 2m long
- **FOOD:** plants
- **LIVED:** about 75 million years ago in the Late Cretaceous Period in Mongolia



ROUGH AND READY

Goyocephale did not have a smooth skull like *Homalocephale*. Its head was rough and knobbly. *Goyocephale*'s backbone was strongly built to cope with the impact of head-bashing contests!

ALWAYS ALERT

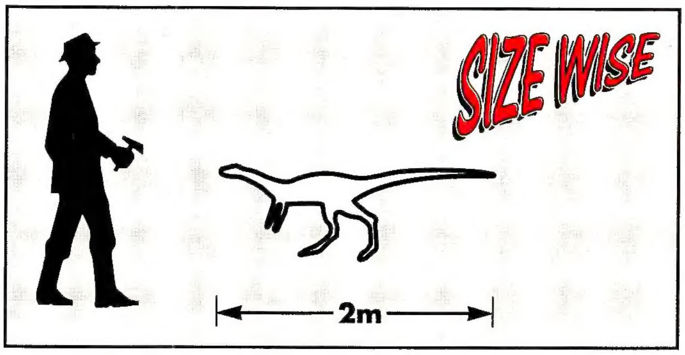
Goyocephale could be easily overtaken by a speedy predator such as *Velociraptor*. So it had to be constantly on the alert for danger.

The winner of the head-butting battles probably had first choice of a mate.

FULGUROTHERIUM

***Fulgurotherium* was a rare plant-eating dinosaur from Australia.**

Although experts believe many Australian dinosaurs existed, finds are still quite rare. All that was found of *Fulgurotherium* was a thigh bone. It lived at about the same time as other Australian plant-eaters like *Muttaburrasaurus* and *Minmi* but was smaller and lighter than those dinosaurs.

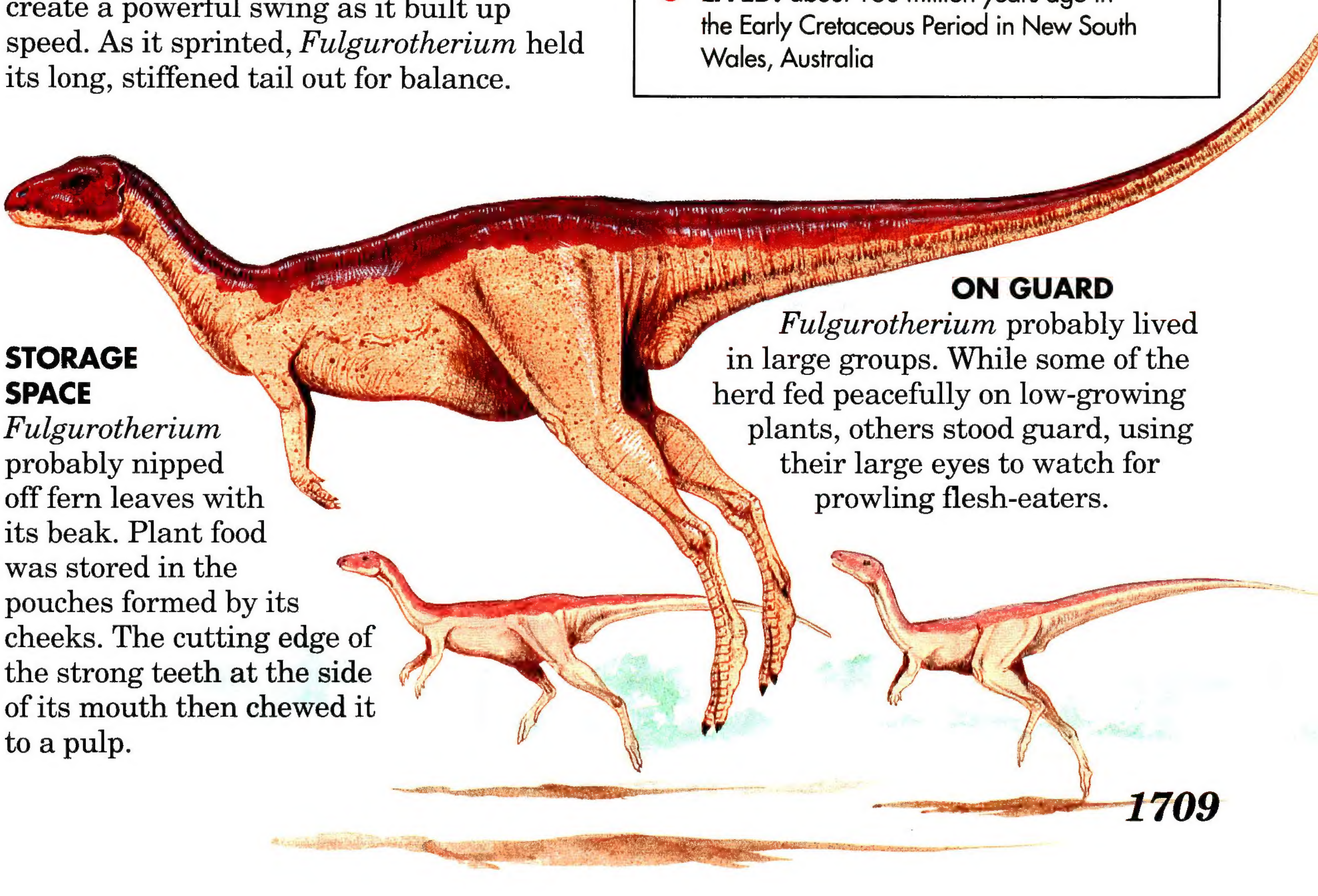


MONSTER FACTS

- **NAME:** *Fulgurotherium* (full-goo-roh-theh-ree-um) means 'lightning beast'
- **GROUP:** dinosaur
- **SIZE:** 2m long
- **FOOD:** plants
- **LIVED:** about 130 million years ago in the Early Cretaceous Period in New South Wales, Australia

LEG SWING

Fulgurotherium was about as long as a large sheep. It was light and could move swiftly on two slender legs. Its strong thigh bones and long lower legs helped to create a powerful swing as it built up speed. As it sprinted, *Fulgurotherium* held its long, stiffened tail out for balance.



STORAGE SPACE

Fulgurotherium probably nipped off fern leaves with its beak. Plant food was stored in the pouches formed by its cheeks. The cutting edge of the strong teeth at the side of its mouth then chewed it to a pulp.

ON GUARD

Fulgurotherium probably lived in large groups. While some of the herd fed peacefully on low-growing plants, others stood guard, using their large eyes to watch for prowling flesh-eaters.

Dinosaur lodgers

Even the largest and the most fierce of dinosaurs provided food for animals much smaller than themselves.

A big *Apatosaurus* pushes its way through the scrubby woodland of Late Jurassic North America. It has become separated from its herd, and the open woodland, where packs of *Ceratosaurus* roam and mighty *Allosaurus* threaten, is a dangerous place for a lone dinosaur to be wandering.

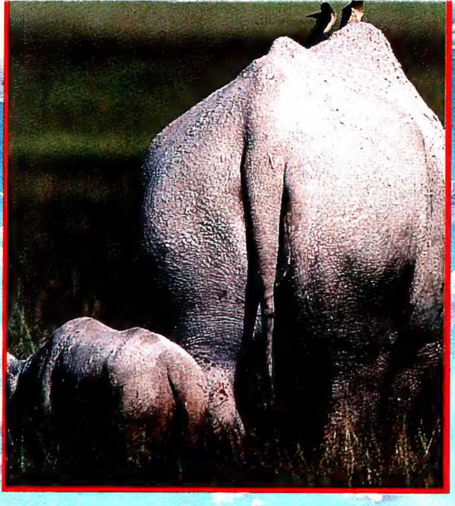
A BIG MEAL

Yet it is not alone. A huge animal such as an *Apatosaurus* is rather like a walking island. All sorts of other creatures live on it. Its skin and blood are tempting foods for many animals.

FOSSIL ITCHES

We know that fleas were present by the Early Cretaceous, and although lice did not appear until after the death of the dinosaurs, it seems likely that the vast area of skin on our lone *Apatosaurus* was the feeding ground of many types of parasite. There may have been insects like our modern warble flies that laid eggs in an animal's skin. When the grub hatched it burrowed its way through the skin, eating it as it went.

When a farmer turns over the soil with a plough, he disturbs all kinds of animals that live there. Birds always follow the plough for an easy meal. The big dinosaurs may have attracted flocks of small animals too.



A rhino on the African plains today has parasites that are eaten by little birds called oxpeckers.

WALKING RESTAURANT

Where there are lots of invertebrates (animals without backbones, such as insects) larger insect-eating animals gather to feed on them. In the case of *Apatosaurus,* these were probably pterosaurs such as *Mesadactylus*. We can imagine flights of little pterosaurs swinging around *Apatosaurus*' swaying neck, settling on its flanks, prodding about in its skin, and then taking off with a grub or parasite.

HITCHING A RIDE

The earliest birds may have joined in the feast too, perching on the tall backbone, hitching a ride. The oxpecker, an African bird, behaves in the same way today, riding on the backs of rhinoceroses.

APATODOZER

Now let us look at the feet of *Apatosaurus*. They carry 30 tonnes of animal, so they must cause some disturbance as they push through thickets, trample undergrowth and churn up the soil. Insects and other small beasts are disturbed and scattered, scuttling for cover as their world splinters about them. Worms and other burrowing creatures ooze out of the soil as their burrows collapse.

IN A GIANT'S FOOTSTEPS

And along come animals to feed on these scattered animals. Small shrew-like animals, such as *Alticonodon,* and small dinosaurs may have hunted around the feet of the giants, feasting on the insects disturbed by them. In the same area as *Apatosaurus* we have found the leg bone of an adult dinosaur that was only 15cm tall at the hips.

What is? A PARASITE

A parasite is an animal that feeds from the body of a living animal. It lives on or in the body of its host. Fleas and ticks that live on a dog and suck its blood are common parasites today.

NOT ALONE

As *Apatosaurus* pushes its way through the scrubland in search of its herd, it is watched from the shadows. A huge *Allosaurus* lies in the dappled sunlight beneath a spreading gingko tree. It has no interest in *Apatosaurus* because it is not long since it has eaten.

DANGEROUS DARE?

Its jaws are slightly agape and little pterosaurs are scrabbling over its lips and darting their heads in and out between its great curved teeth. A dangerous business? Not really. Scraps of meat and slivers of gristle from the last meal still stick to the saw-like edges of its teeth. It is these that the pterosaurs are after.

POISONOUS BITE

They will not take them all. Some of the meat will rot where it has become wedged, and this will help to give *Allosaurus* a poisonous bite – useful against big prey and rivals amongst its own species.

TODAY'S DARE DEVILS

When today's crocodiles lie with their mouths open little birds hop inside to peck shreds of leftover meat from between their teeth. It is more than likely that dinosaurs allowed pterosaurs to do the same.

BLOOD SUCKERS

It is not just the meat scraps that the pterosaurs are after. Little leeches – blood-sucking worms – have attached themselves to the soft flesh of the dinosaur's gums and are feeding on its blood. This cannot be avoided because *Allosaurus* must drink from shallow ponds and sluggish rivers where leeches lie in wait. These leeches also provide a tasty morsel for the pterosaurs.

Elephants enjoying a dust bath which will clean off many parasites.

CRUMBS FROM THE TABLE

Not far away is a scrabbling, hissing noise. The remains of *Allosaurus*' last kill is nothing but a pile of splintered bones and a smear of blood on the ground, but a pack of hungry *Ornitholestes* is fighting over the meagre remains. *Allosaurus* has had its fill, and so has a small group of *Ceratosaurus* that followed *Allosaurus*' hunt. Now it is the turn of the small animals. Soon there will be nothing left but bones, and gradually these will be broken down by bacteria and fungi.

Is it true that dinosaurs really had lodgers?

Unfortunately, we cannot tell. It is mostly guesswork. But it is guesswork based on facts about animals today. We know about their habits and the ways in which animals interact, so it is quite possible that dinosaurs had parasites and that helpful little animals, such as pterosaurs, helped to keep the dinosaurs as pest-free as possible.

DUST BATH

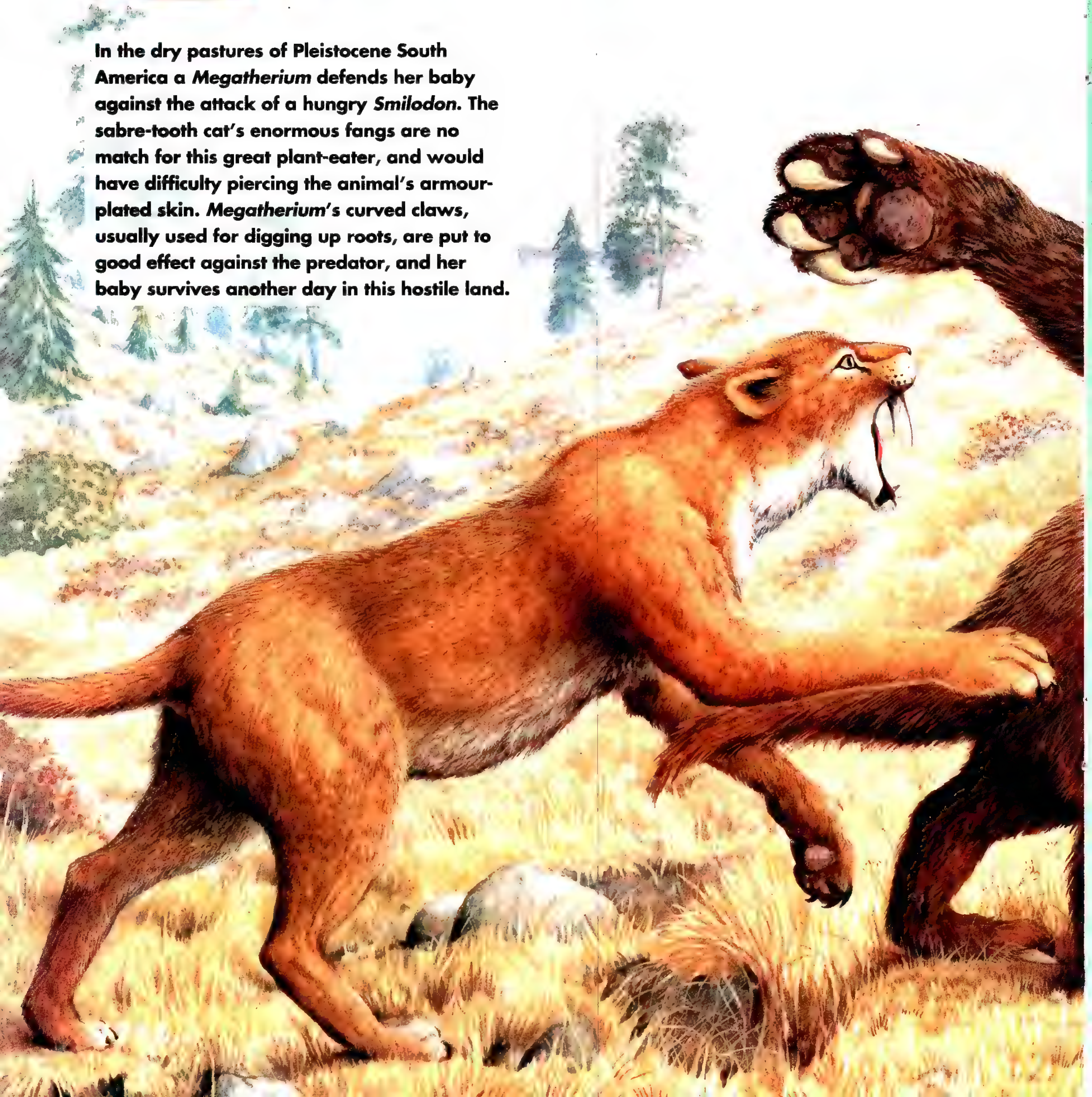
Apatosaurus finds its herd lying in a dusty hollow, rolling and thrashing about in the dust. Clouds of dust are swirling up, helping to choke the parasites on the animals' skins.

Pterosaurs pick the food from *Allosaurus'* teeth.

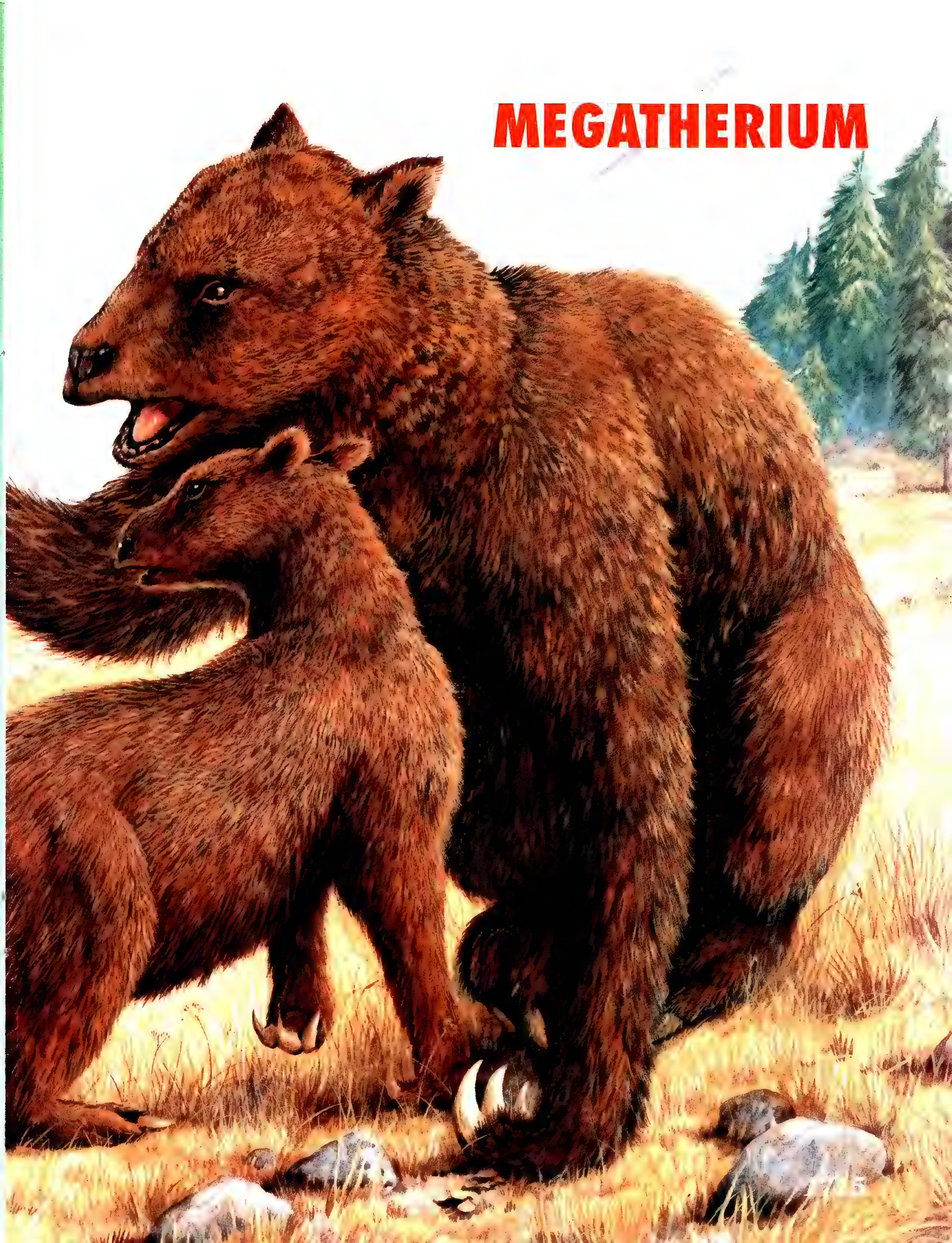
Jackals and hyenas follow lion packs in Africa today, to feed on meat left over from the hunt.

GIANTS OF THE PAST

In the dry pastures of Pleistocene South America a *Megatherium* defends her baby against the attack of a hungry *Smilodon*. The sabre-tooth cat's enormous fangs are no match for this great plant-eater, and would have difficulty piercing the animal's armour-plated skin. *Megatherium*'s curved claws, usually used for digging up roots, are put to good effect against the predator, and her baby survives another day in this hostile land.



MEGATHERIUM



3-D Gallery

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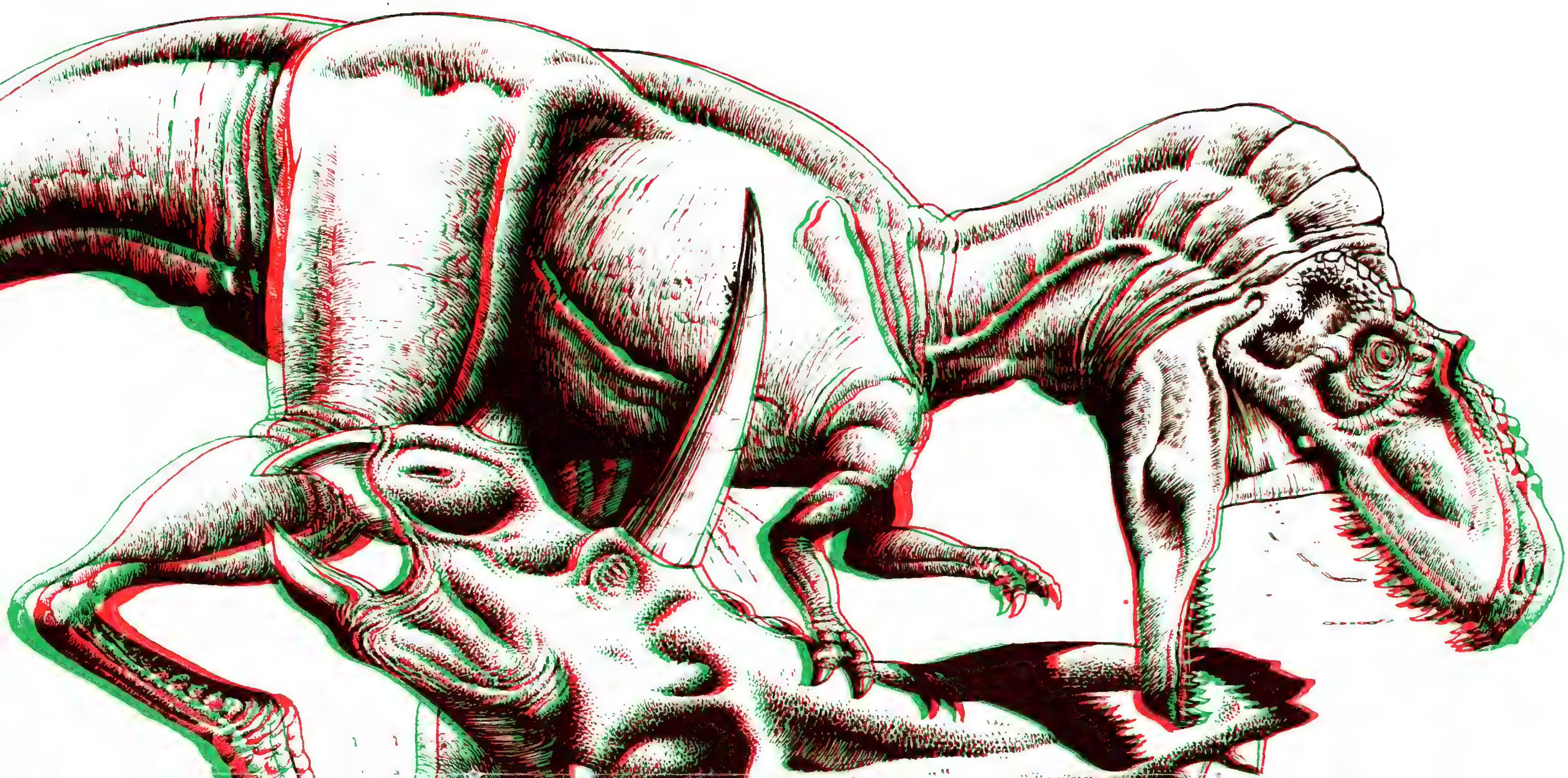
PENTACERATOPS

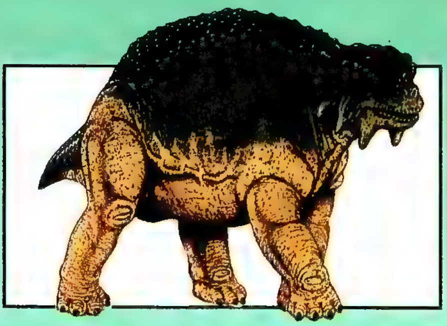


In Late Cretaceous New Mexico, USA, a *Pentaceratops* rushes to the rescue of its injured herd-mate. With its head lowered and its three deadly prongs aimed at the soft underbelly of *Albertosaurus*, *Pentaceratops* gores the attacker.

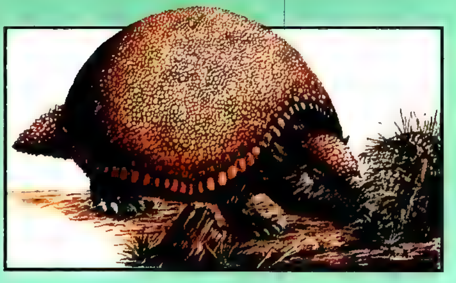
Prehistoric plant-eaters

All these prehistoric animals had one thing in common. They ate plants. But they lived millions of years apart and belonged to different animal groups.

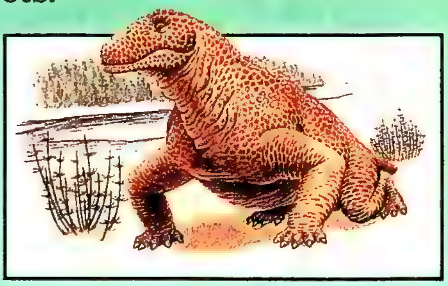
Many had strong teeth to bite off tough vegetation and grind it to a pulp. Some had feeble teeth and nibbled soft plants. Others shovelled earth with strong tusks to search for roots.



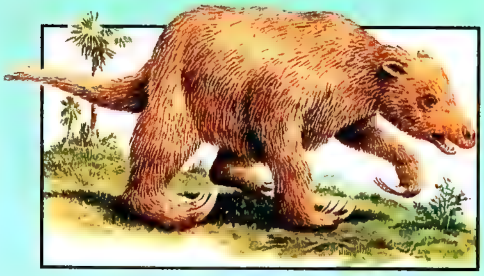
NAME: *Scutosaurus*
GROUP: reptile
SIZE: 2.5m long
LIVED: Late Permian



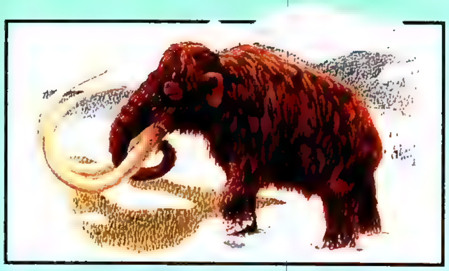
NAME: *Glyptodon*
GROUP: mammal
SIZE: 3m long
LIVED: Pliocene – Pleistocene



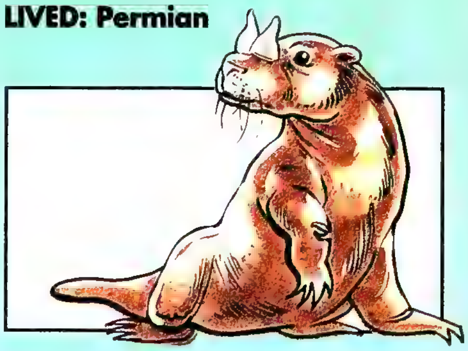
NAME: *Moschops*
GROUP: mammal-like reptile
SIZE: 5m long
LIVED: Permian



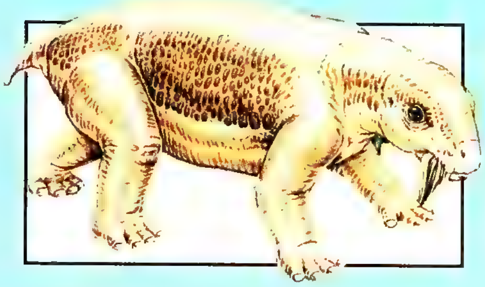
NAME: *Megatherium*
GROUP: mammal
SIZE: 6m long
LIVED: Pliocene – Pleistocene



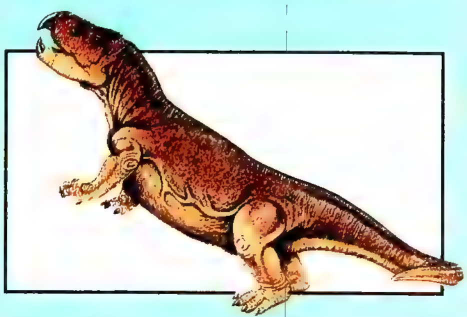
NAME: Mammoth
GROUP: mammal
SIZE: 4.5m long
LIVED: Pliocene – Pleistocene



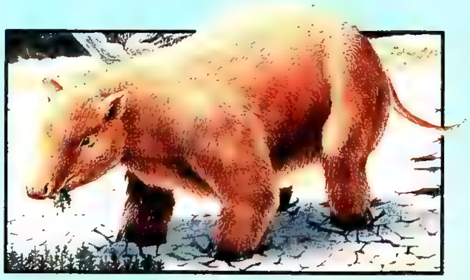
NAME: *Epigaulus*
GROUP: mammal
SIZE: 30cm long
LIVED: Miocene



NAME: *Lystrosaurus*
GROUP: mammal-like reptile
SIZE: 1.5m long
LIVED: Early Triassic

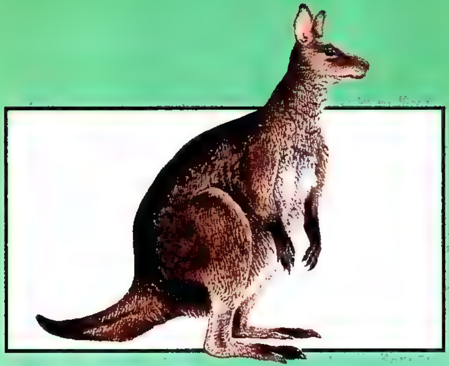


NAME: *Scaphonyx*
GROUP: reptile
SIZE: 1-2.5m long
LIVED: Mid Triassic

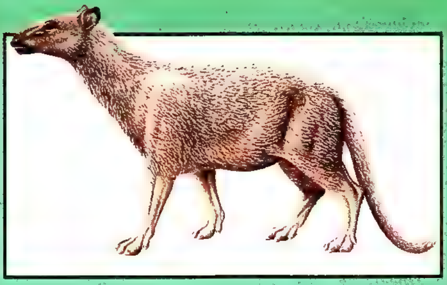


NAME: *Diprotodon*
GROUP: mammal
SIZE: 3m long
LIVED: Pleistocene

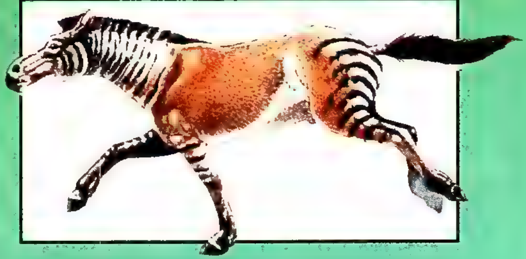
SPOTTER'S GUIDE



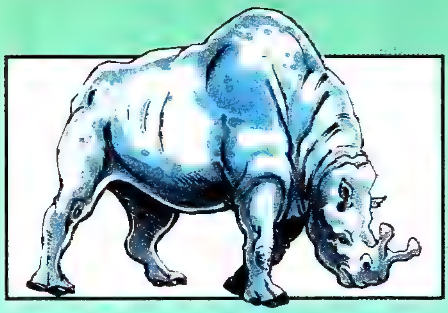
NAME: ***Sthenurus***
GROUP: mammal
SIZE: 3m tall
LIVED: Pliocene – Pleistocene



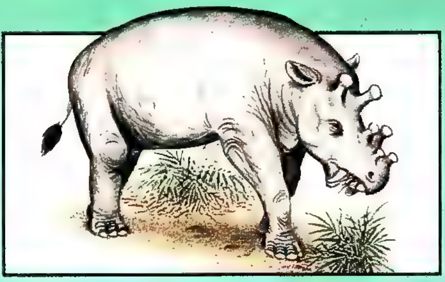
NAME: ***Phenacodus***
GROUP: mammal
SIZE: 1.5m long
LIVED: Palaeocene – Eocene



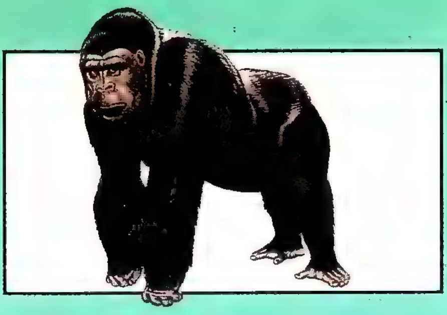
NAME: ***Merychippus***
GROUP: mammal
SIZE: 1m tall
LIVED: Miocene



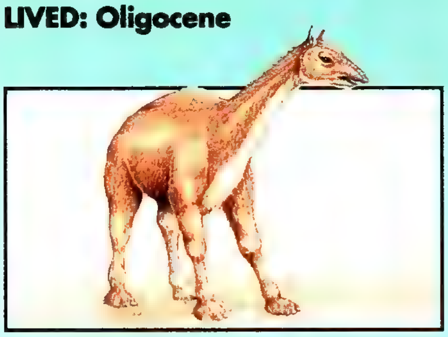
NAME: ***Brontotherium***
GROUP: mammal
SIZE: 4.5m long
LIVED: Oligocene



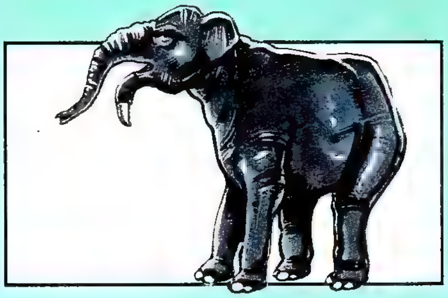
NAME: ***Uintatherium***
GROUP: mammal
SIZE: 4m long
LIVED: Eocene



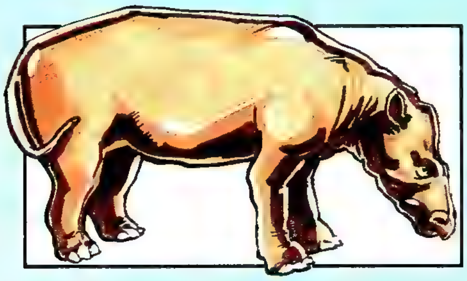
NAME: ***Gigantopithecus***
GROUP: mammal
SIZE: 3m tall
LIVED: Pleistocene



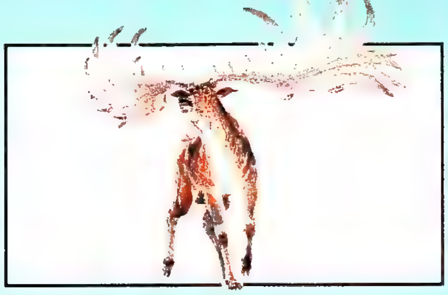
NAME: ***Macrauchenia***
GROUP: mammal
SIZE: 3m long
LIVED: Pleistocene



NAME: ***Deinotherium***
GROUP: mammal
SIZE: 4m tall
LIVED: Pliocene



NAME: ***Coryphodon***
GROUP: mammal
SIZE: 3m long
LIVED: Palaeocene – Eocene



NAME: ***Megaloceras***
GROUP: mammal
SIZE: 3m long
LIVED: Pleistocene

KEY

PERMIAN PERIOD:
290-245 MYA

TRIASSIC PERIOD:
245-204 MYA

JURASSIC PERIOD:
204-140 MYA

CRETACEOUS PERIOD:
140-66 MYA

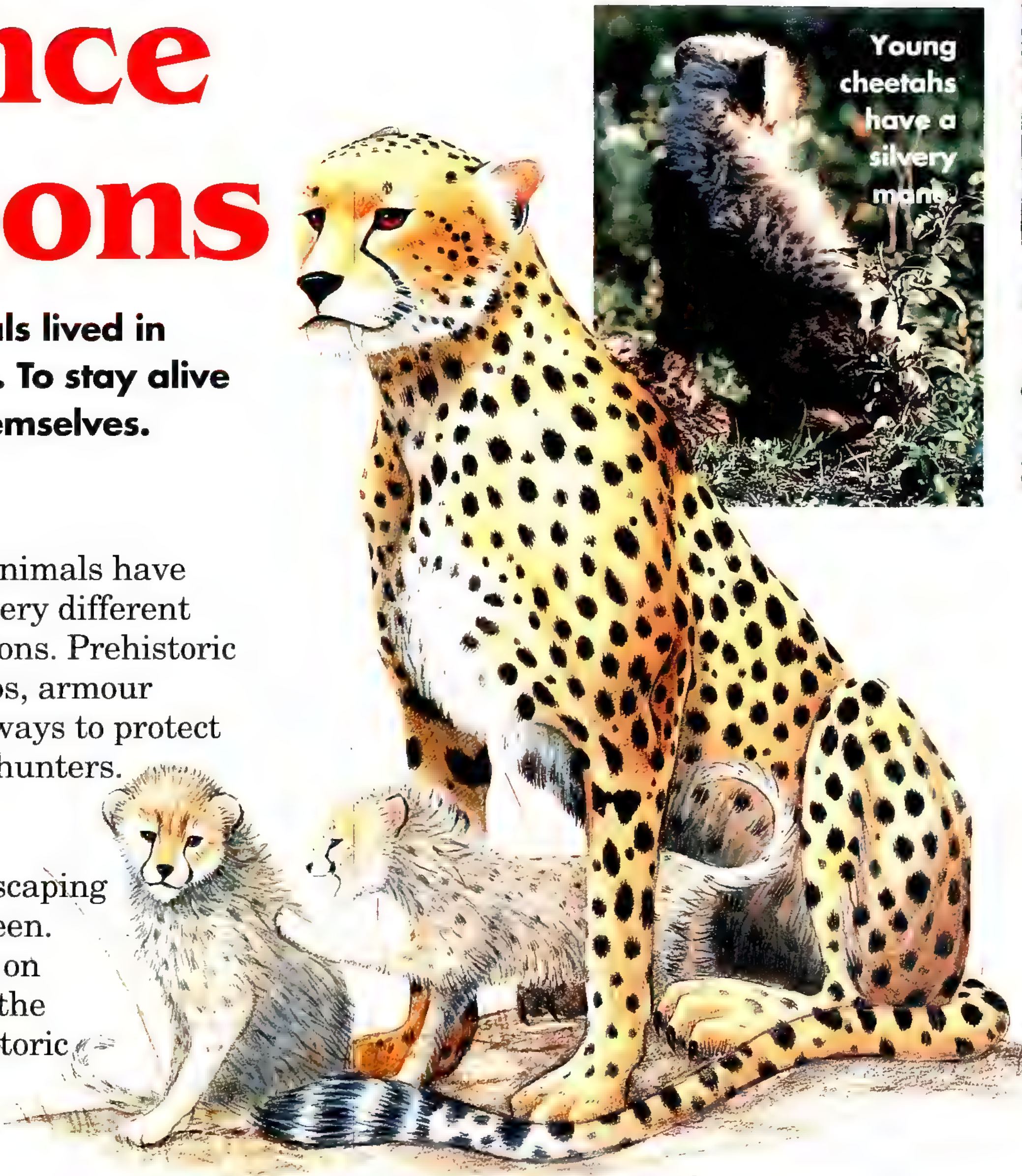
TERTIARY PERIOD:
Palaeocene Epoch 66-56 MYA
Eocene Epoch 56-35 MYA
Oligocene Epoch 35-23 MYA
Miocene Epoch 23-6 MYA
Pliocene Epoch 6-2 MYA

QUATERNARY PERIOD:
Pleistocene Epoch 2 MYA

Defence weapons

Most prehistoric animals lived in danger of being eaten. To stay alive they had to defend themselves.

Different animals have evolved very different defence weapons. Prehistoric animals used spines, clubs, armour plating, horns and hideaways to protect themselves from hungry hunters.


Young cheetahs have a silvery mane.

Perhaps *Dinofelis'* cubs, 3 million years ago, had a silvery mane too.

OUT OF SIGHT

One of the best ways of escaping attack is to avoid being seen. Many animals today rely on camouflage to blend into the background. Their prehistoric ancestors probably had special colouring or markings to melt into their surroundings, too.

TRICK TACTICS

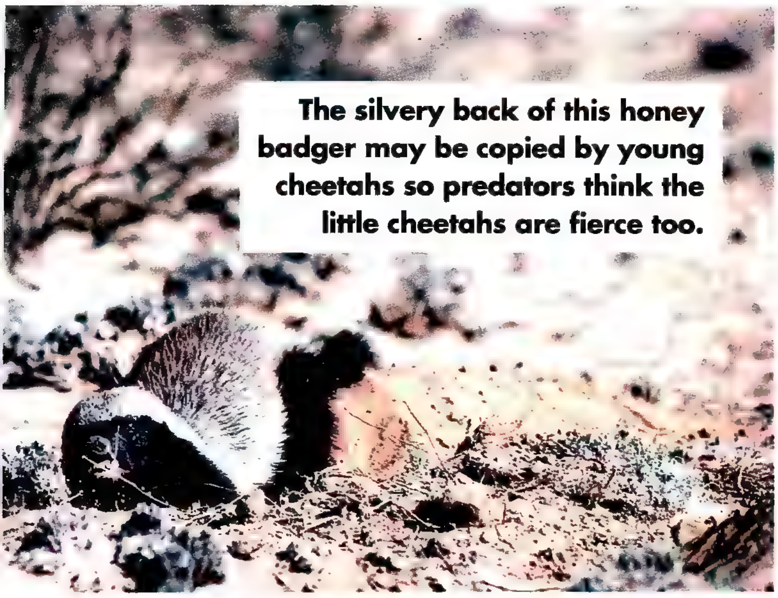
Some defenceless creatures use camouflage in a different way. They develop the same colours and markings as really dangerous animals to frighten their attackers away. Today, cheetah cubs use this trick. They look rather like a fierce meat-eater called the honey badger when they are young and defenceless. Prehistoric ancestors of the cheetah could have used the same tactic. Perhaps, three million years ago, the cubs of *Dinofelis* looked much fiercer than they were.

MANE CHANCE

Today's very young cheetahs have a silvery mane of long hair on their heads and shoulders which also helps to keep them hidden in the long grass. It is possible that *Dinofelis* cubs had a mane too.

MENACING LOOKS

Many harmless animals use the way they look to scare predators away. They have huge horns or sharp spines to make themselves seem more menacing than they really are.



The silvery back of this honey badger may be copied by young cheetahs so predators think the little cheetahs are fierce too.

STRANGE DEFENCE

More than 250 million years ago, a newt called *Diplocaulus* did much the same. *Diplocaulus* was weak and defenceless but it had an extraordinary pair of bony horns on its head. They stuck out sideways rather like a boomerang and looked very alarming.

HARD TO SWALLOW

The odd shape of its head would have made *Diplocaulus* pretty hard to swallow. It would almost certainly have made the giant amphibian *Eryops* think twice before gobbling it up. Some trilobites also had spines that stopped them from being eaten by predators.

IT'S A FACT

SPINY SHARK

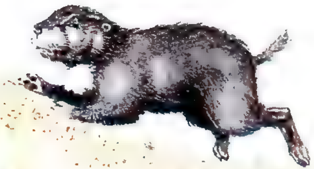
The tiny prehistoric fish *Climatius* protected itself from attack with a special weapon. It had 15 bristling fin spines, so it would have been a very painful mouthful.

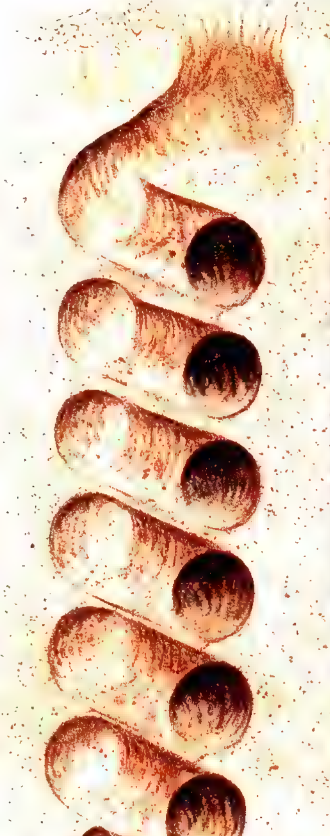
HOME SWEET HOME

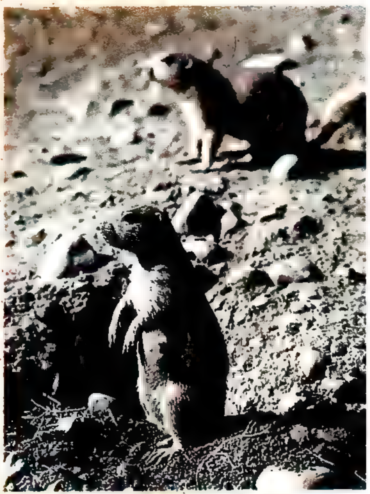
Sometimes the best defence is to hide. Snails disappear into their shells. And rabbits scuttle down into their burrows. A prehistoric beaver called *Paleocastor* dug corkscrew-like burrows to escape from predators. Scientists have found burrows up to 2.5m deep in Nebraska, USA.

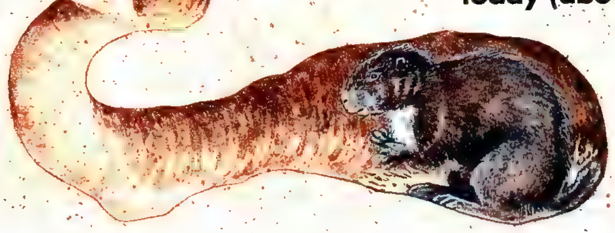
QUICK GETAWAY

An animal may try to escape by flying, swimming or running faster than its attacker. In Oligocene times, the long-legged *Theosodon* probably defended itself by sprinting away from giant meat-eating birds, such as *Phorusrhacos*.









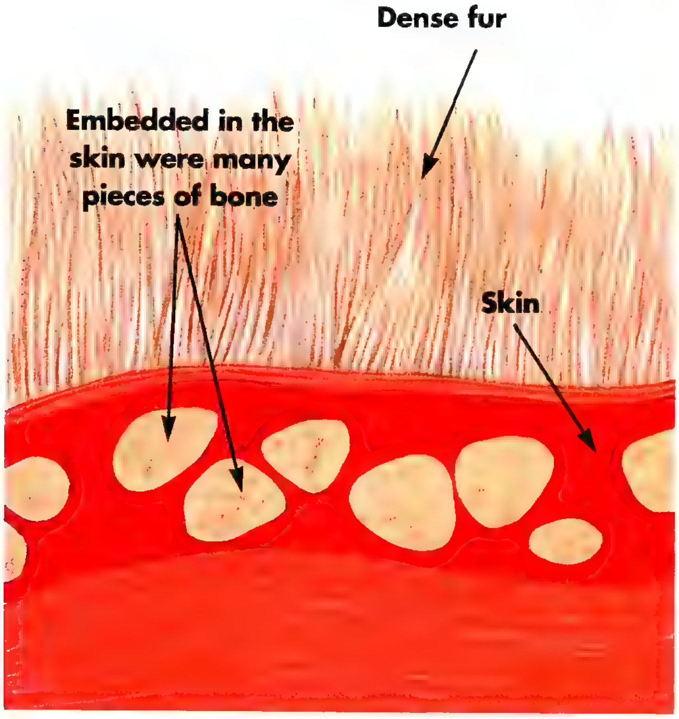
***Paleocastor* dived into its corkscrew-like burrow when danger threatened, as do prairie dogs today (above).**

TANKED UP

Some of the strangest-looking prehistoric animals had tough body armour which they used to defend themselves. The glyptodonts were well protected by plates of bone from nose to tail.

SHELL SHOCK

Glyptodonts lived about 20 million years ago. They were distant ancestors of today's armadillos. Glyptodonts were peaceful plant-eaters. But they looked terrifying. They were covered in a huge, tough shell made of plates of bone and horn. And they had sharp claws to defend themselves with. Some, like *Doedicurus*, had a spiked tail club to lash out with. The biggest family member was *Glyptodon*. It was as large as a rhinoceros and as heavily armoured as a tank.



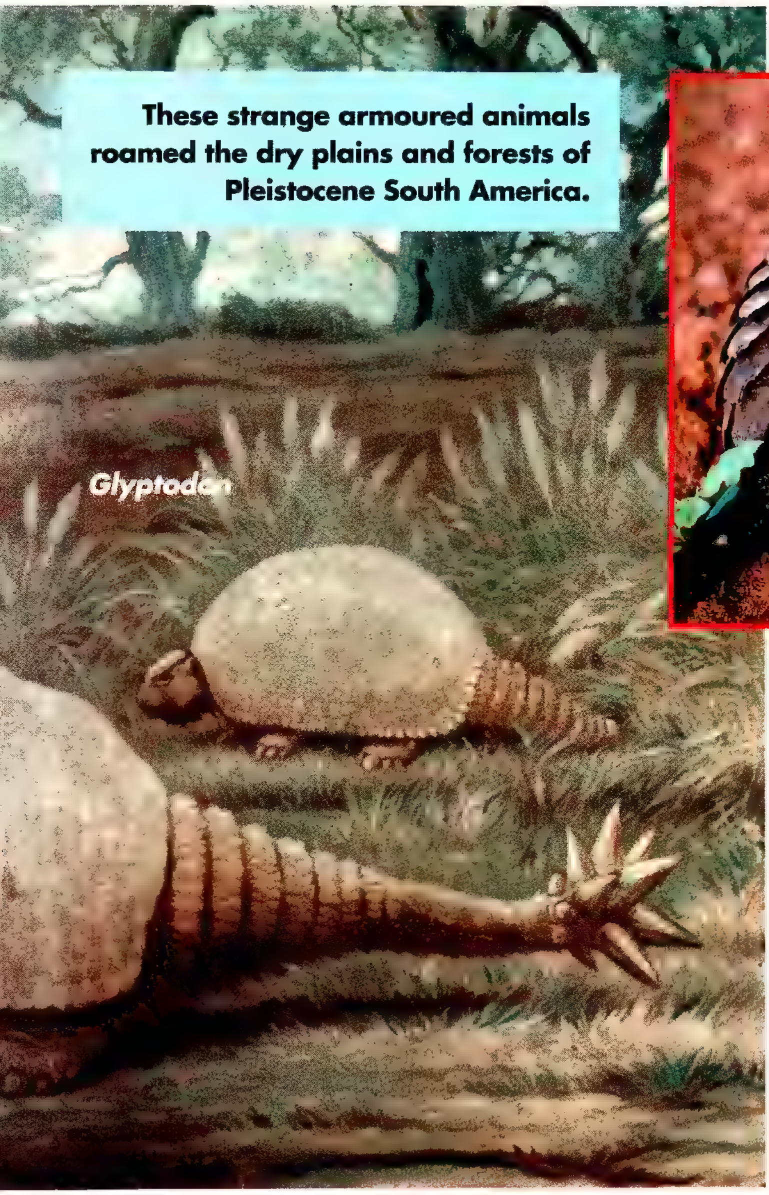
Ground sloths were the largest armoured animals but their armour could not easily be detected. The bony plates that protected them were hidden beneath their thick fur.

EASY MOVER

The armour on a glyptodont made a solid shield. But it also allowed the animal to move about easily. The small plates on the head and tail were hinged together to move with the animal.

CLOSE FIT

Glyptodon's armour fitted together closely like a mosaic. It had a hard helmet to protect the head and spiny rings of bone to protect the tail. Both *Glyptodon* and *Doedicurus* would have used their body armour to protect themselves from predators, such as the big cats that lived in South America in Pleistocene times.



These strange armoured animals roamed the dry plains and forests of Pleistocene South America.

SKIN DEEP

The bony armour of the glyptodonts was easy to see. But the prehistoric ground sloths had a more secret weapon. Under their skins the ground sloths were protected by a layer of pieces of bone. This armour-plating was completely hidden beneath their thick fur.

JUMBO SIZE

Ground sloths were the ancestors of today's tree sloths. But they looked and behaved quite differently. They were the largest armoured mammals, some weighing over 3 tonnes, and most of them were much too big to climb a tree.

Eomanis **probably rolled up into a ball to protect itself from attack, just like this long-tailed pangolin does today.**

ARMOURED GIANT

One of the largest was *Megatherium*, which lived about 5 million years ago. As big as an elephant, it could rear up even higher on its hind legs to hook down branches with its long, curved front claws.

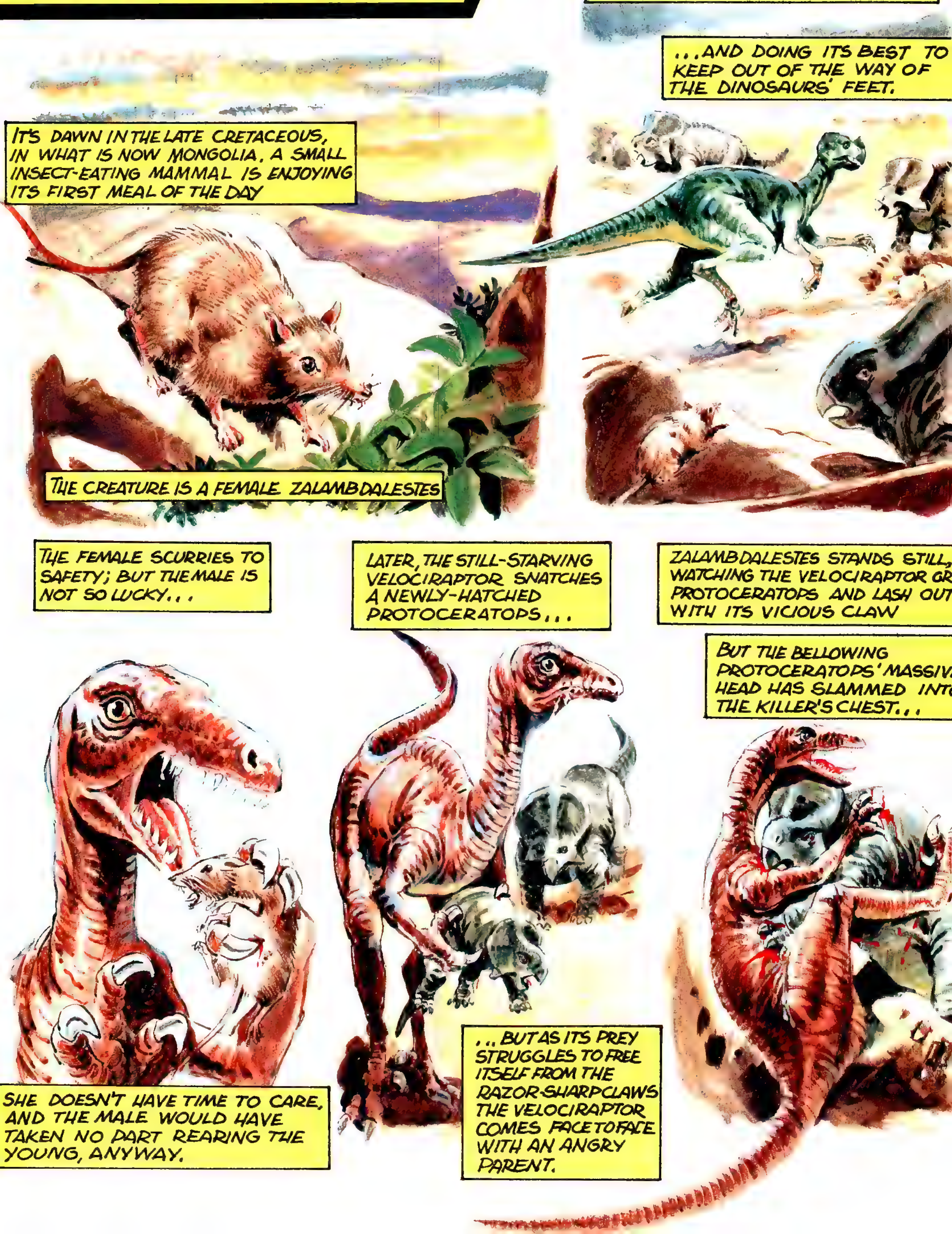
ANT ATTACK

Eomanis, a prehistoric pangolin which lived 55 million years ago, had special body armour too. It was protected by a covering of broad, overlapping horny scales. Like today's pangolins, *Eomanis* must have curled up into a small armoured ball when danger threatened. It was also probably able to close its eyes, ears and nose against the stings of the ants it ate.

Is it true that people lived inside glyptodonts?

Yes. The shells of large glyptodonts were so big, the early settlers of South America sometimes used them as shelters.

A DAY IN THE LIFE OF ZALAMBDALESTES



IT'S DAWN IN THE LATE CRETACEOUS, IN WHAT IS NOW MONGOLIA, A SMALL INSECT-EATING MAMMAL IS ENJOYING ITS FIRST MEAL OF THE DAY

THE CREATURE IS A FEMALE ZALAMBDALESTES

ZALAMBDALESTES SPENDS MOST OF THE DAY LOOKING FOR FOOD...

...AND DOING ITS BEST TO KEEP OUT OF THE WAY OF THE DINOSAURS' FEET.

THE FEMALE SCURRIES TO SAFETY; BUT THE MALE IS NOT SO LUCKY...

SHE DOESN'T HAVE TIME TO CARE, AND THE MALE WOULD HAVE TAKEN NO PART REARING THE YOUNG, ANYWAY.

LATER, THE STILL-STARVING VELOCIRAPTOR SNATCHES A NEWLY-HATCHED PROTOCERATOPS...

...BUT AS ITS PREY STRUGGLES TO FREE ITSELF FROM THE RAZOR-SHARP CLAWS THE VELOCIRAPTOR COMES FACE TO FACE WITH AN ANGRY PARENT.

ZALAMBDALESTES STANDS STILL, WATCHING THE VELOCIRAPTOR GR PROTOCERATOPS AND LASH OUT WITH ITS VICIOUS CLAW

BUT THE BELLOWING PROTOCERATOPS' MASSIV HEAD HAS SLAMMED INT THE KILLER'S CHEST...

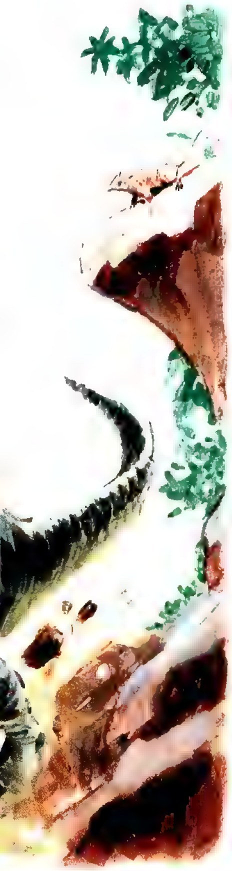
FROM ITS SHELTER, ZALAMBDALESTES WATCHES AS AN OVIRAPTOR STEALS AN EGG FROM A PROTOCERATOPS' NEST.

ZALAMBDALESTES DON'T LAY EGGS. FEMALES GIVE BIRTH TO LIVE YOUNG A FEW WEEKS AFTER THEY HAVE MATED WITH A MALE.

SUDDENLY, AFTER THE PAIR HAVE MATED...

A SHARP-EYED VELOCIRAPTOR HAS SPOTTED THE TWO LITTLE ZALAMBDALESTES.

USUALLY IT WOULDN'T BOTHER WITH SUCH TINY ANIMALS, BUT THIS ONE IS RAVENOUS.



UNABLE TO ESCAPE FROM EACH OTHER, AND WITH BLOOD STREAMING FROM THEIR GAPING WOUNDS, THE TWO DINOSAURS SINK TO THE GROUND...

...AND SENSING THAT AN EASY MEAL MAY SOON BE THEIRS FOR THE TAKING, SMALL SCAVENGERS APPEAR AS IF BY MAGIC.

A FEW WEEKS LATER, THE FEMALE ZALAMBDALESTES GIVES BIRTH...

...AND SUCKLES HER YOUNG WITH MILK.

Improve and test your knowledge with...

FACT FILE

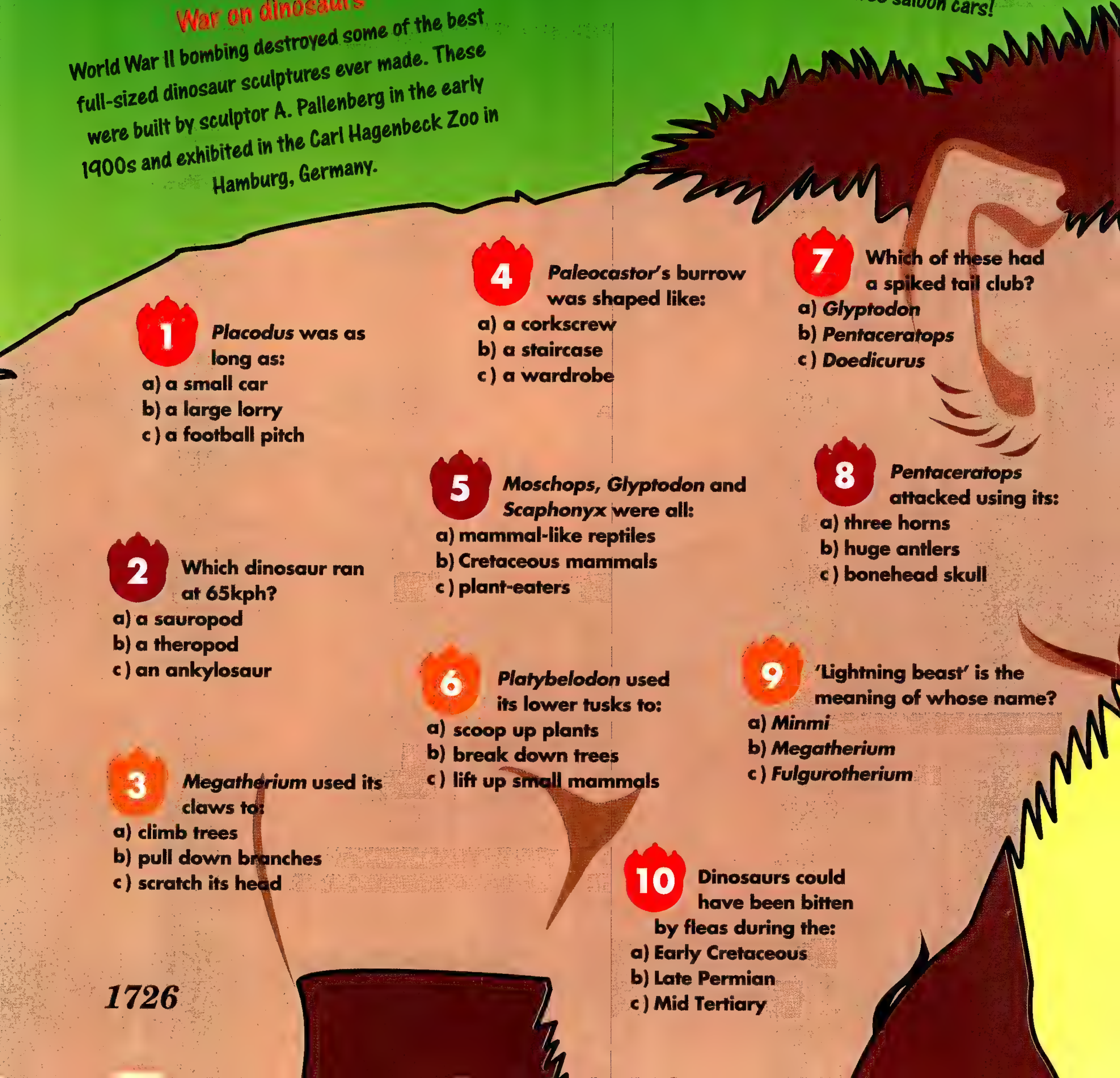
Follow the footprints on the mammoth's back and answer the questions posed.

Big snake

The biggest snake known is *Gigantophis* from Eocene Egypt. It is only known from a few vertebrae and a piece of jawbone, but it was probably about 11 metres in length – longer than three saloon cars!

War on dinosaurs

World War II bombing destroyed some of the best full-sized dinosaur sculptures ever made. These were built by sculptor A. Pallenberg in the early 1900s and exhibited in the Carl Hagenbeck Zoo in Hamburg, Germany.



1 *Placodus* was as long as:
a) a small car
b) a large lorry
c) a football pitch

2 Which dinosaur ran at 65kph?
a) a sauropod
b) a theropod
c) an ankylosaur

3 *Megatherium* used its claws to:
a) climb trees
b) pull down branches
c) scratch its head

4 *Paleocastor's* burrow was shaped like:
a) a corkscrew
b) a staircase
c) a wardrobe

5 *Moschops, Glyptodon* and *Scaphonyx* were all:
a) mammal-like reptiles
b) Cretaceous mammals
c) plant-eaters

6 *Platybelodon* used its lower tusks to:
a) scoop up plants
b) break down trees
c) lift up small mammals

7 Which of these had a spiked tail club?
a) *Glyptodon*
b) *Pentaceratops*
c) *Doedicurus*

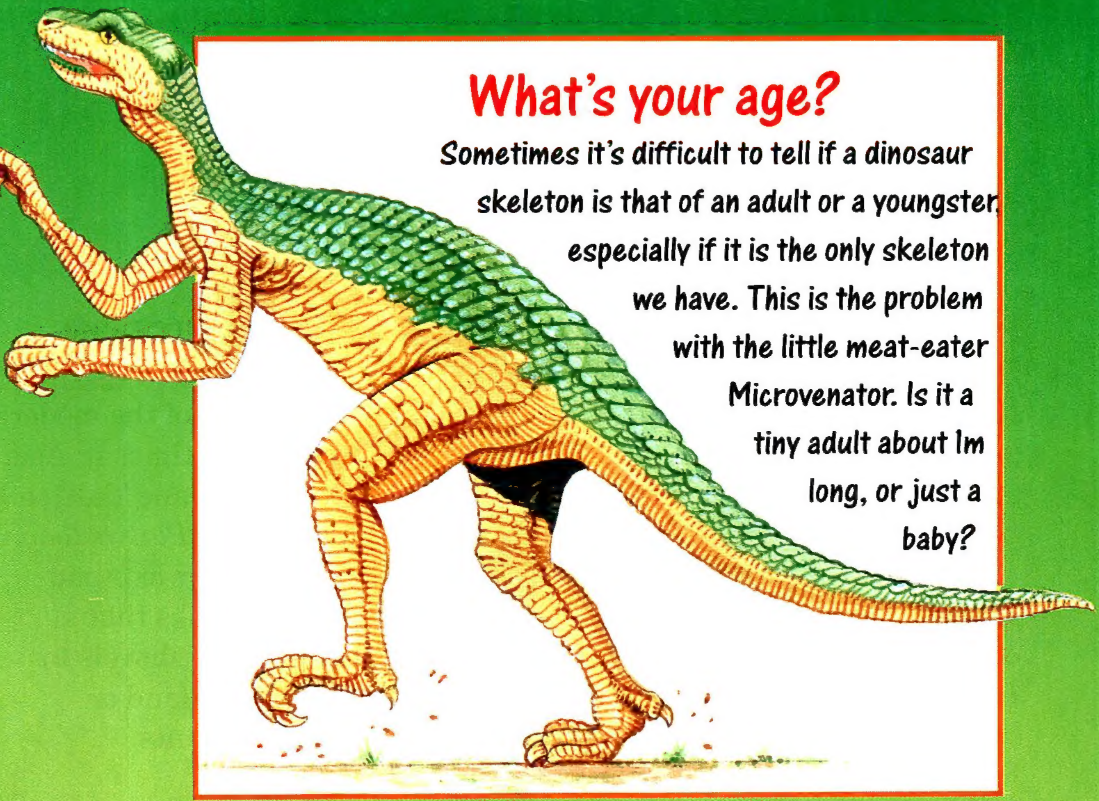
8 *Pentaceratops* attacked using its:
a) three horns
b) huge antlers
c) bonehead skull

9 'Lightning beast' is the meaning of whose name?
a) *Minmi*
b) *Megatherium*
c) *Fulgurotherium*

10 Dinosaurs could have been bitten by fleas during the:
a) Early Cretaceous
b) Late Permian
c) Mid Tertiary

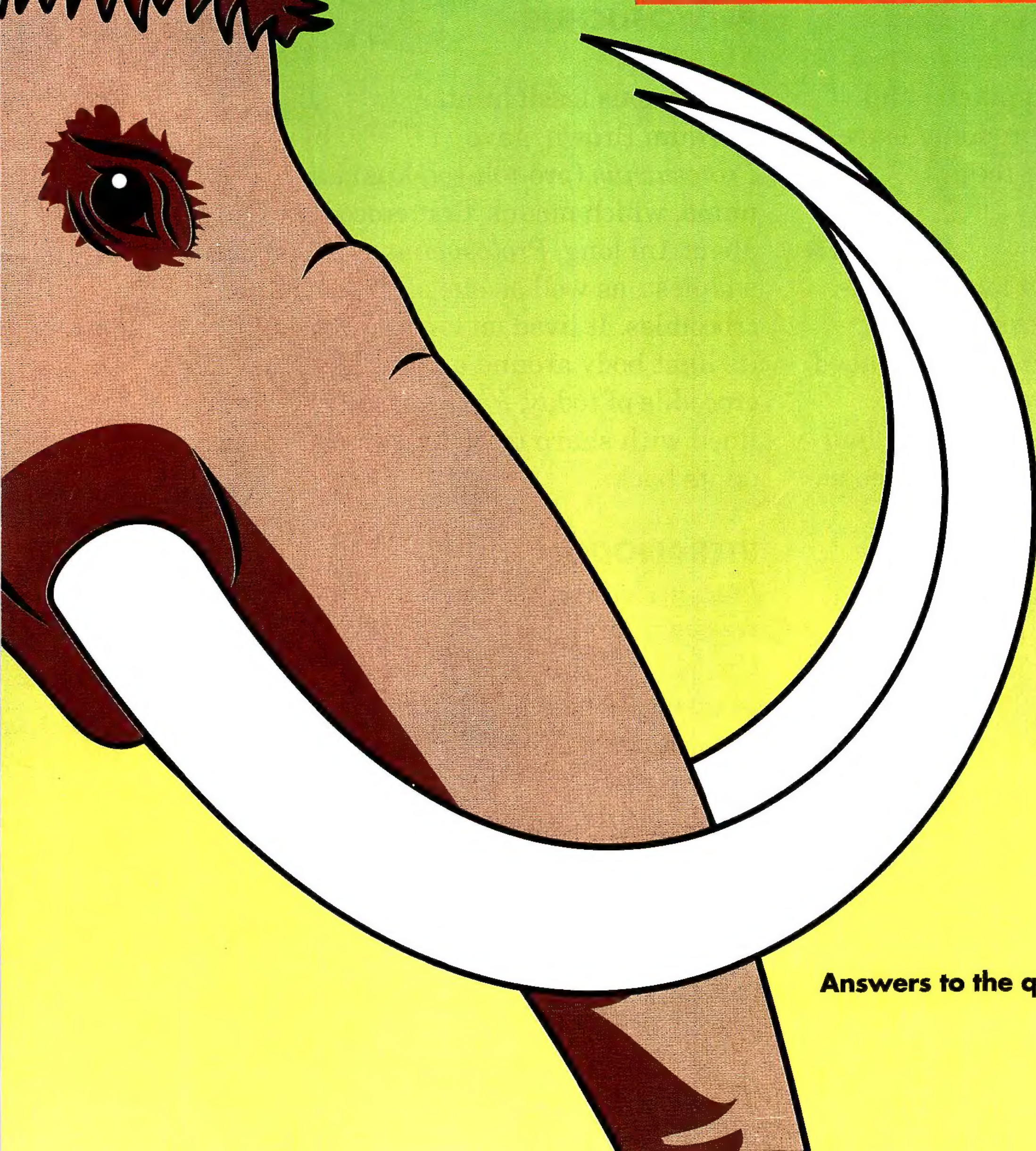
Watch it go!

The footprints of a small, Jurassic theropod found in Arizona indicate that the animal must have been moving at a speed of up to 65 kilometres per hour – as fast as a greyhound.



What's your age?

Sometimes it's difficult to tell if a dinosaur skeleton is that of an adult or a youngster, especially if it is the only skeleton we have. This is the problem with the little meat-eater Microvenator. Is it a tiny adult about 1m long, or just a baby?



Which Megalosaurus?

Megalosaurus, the first dinosaur ever discovered, lived in Europe. Almost every meat-eating dinosaur later found in Europe was also called Megalosaurus. In old books you will find lots of dinosaur skeletons called Megalosaurus, although we now know thay are actually Eustreptospondylus, Metriacanthosaurus and Altispinax, amongst others.

Answers to the questions on inside back cover

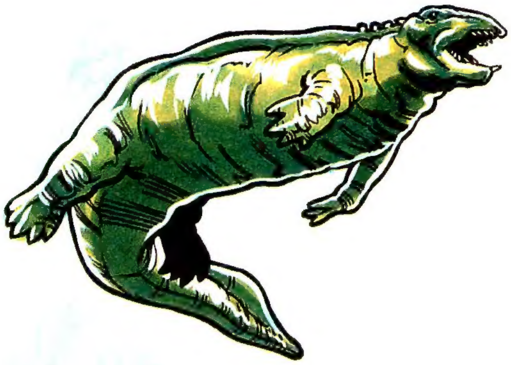
A to Z OF PREHISTORIC ANIMALS PH – PT

PHENACODUS
55 MYA

Phenacodus (fen-a-kode-us) roamed the woods of North America and France in Late Palaeocene and Early Eocene times. It was a sheep-sized plant-eater with a long tail and short legs. *Phenacodus* was one of the first hoofed mammals and had five hoofed toes on each foot. It was a nimble animal, able to dodge in and out of the trees to avoid predators. Inside its long, low skull, *Phenacodus* had square, ridged teeth to crush plants, and large fang-like canines for shredding leaves. *Phenacodus* means 'imposter teeth'.

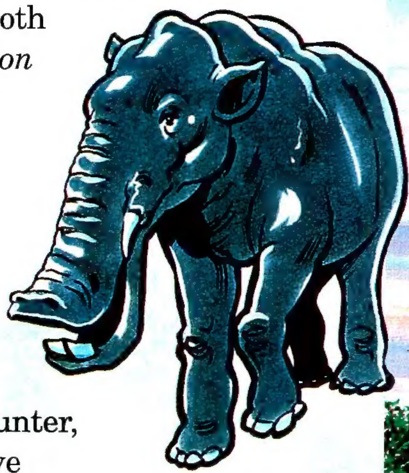
PLACODUS **220 MYA**

Placodus (plak-oh-dus) was a large marine reptile that swam in the Triassic seas of Europe. It plucked molluscs from the seabed and crushed them in its powerful jaws. Almost as long as a small car, *Placodus* had a round body and short limbs that it used as paddles. Its name means 'plate tooth'.



PLATYBELODON **20 MYA**

Platybelodon (plat-ee-bel-oh-don) was an ancestor of the modern elephant. It lived in Miocene times in Asia and its name means 'flat-tooth weapon'. *Platybelodon* had a pair of broad lower tusks that it used like shovels to scoop up land or water plants.



PROTOSUCHUS
180 MYA

The famous fossil hunter, Barnum Brown, gave *Protosuchus* (pro-toh-soo-kus) its name, which means 'first crocodile'. Only about 1m long, *Protosuchus* was one of the smallest, as well as one of the earliest, crocodiles. It lived on land and moved on its light body around on four legs. Like the crocodile of today, *Protosuchus* had jaws lined with sharp teeth and armour-plating on its back.

PTERANODON **75 MYA**

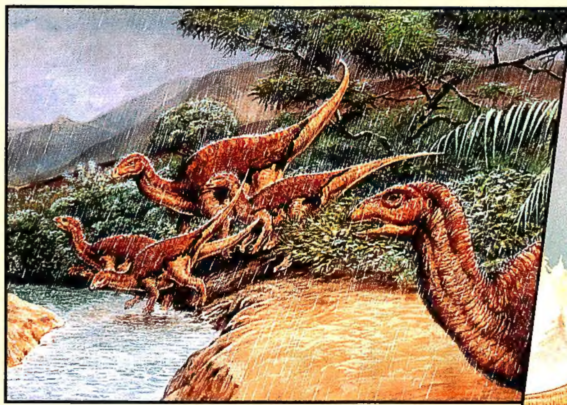
Pteranodon (ter-ran-oh-don) was a flying reptile that glided through the air during the Cretaceous Period. It plucked fish from the sea with its pelican-like beak. *Pteranodon* had enormous, fragile wings which had a span of up to 9m. Although its wingspan was huge, its body was very light. *Pteranodon* means 'winged toothless'.

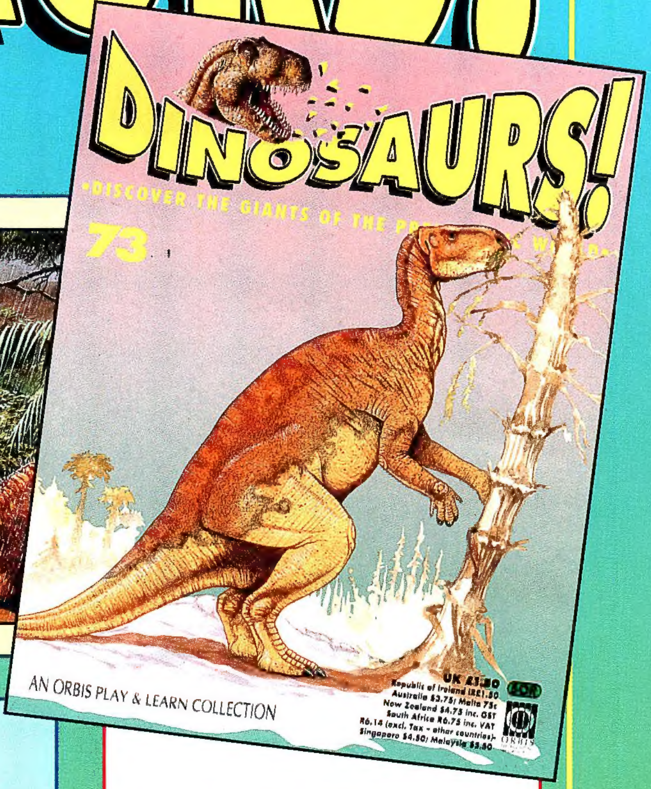
MYA = MILLION YEARS AGO

COMING IN PART 73 OF

DINOSAURS!

Read about ancient mini-beasts in PREHISTORIC WORLD, and the link between birds and dinosaurs in TIME DETECTIVE.

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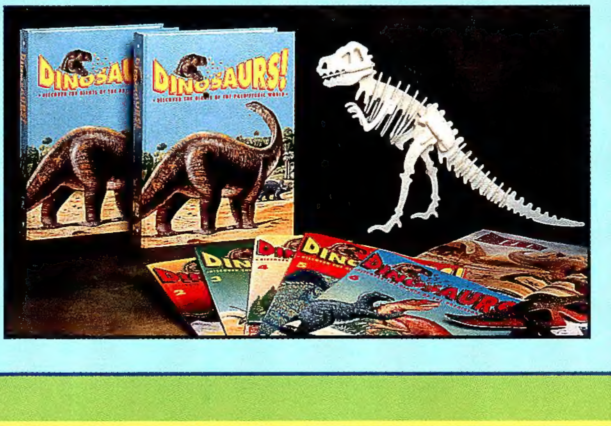

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ANSWERS TO FACT FILE QUESTIONS: 1.a 2.b 3.b 4.a 5.c 6.a 7.c 8.a 9.c 10.a

Dr David Norman of Cambridge University answers your dinosaur questions

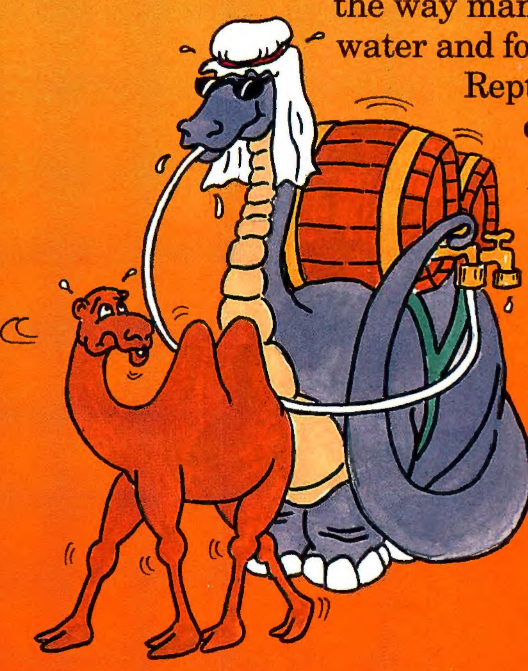
ASK THE EXPERT

If dinosaurs had feathers, would they have had fancy plumes like peacocks?

I don't believe dinosaurs had feathers. But, let's suppose they did. There's no reason why the feathers wouldn't have been brightly coloured. Brightly coloured plumes come in handy for lots of animals. Peacocks use their beautiful feathers to impress peahens and for communication.

Would dinosaurs have had any humps, like camels?

A camel's hump is used for storing fat, which can be converted into water and energy when needed, for example when travelling across waterless deserts. This is the way mammals solve water and food shortages. Reptiles such as dinosaurs do not suffer from these problems to the same extent. So I think it is unlikely that dinosaurs had humps.



Were there dinosaurs in Italy?

The only record of dinosaurs I have been able to trace is in Tuscany, in northwest Italy. Possible Late Triassic theropod footprints were discovered there.

Do we know if any dinosaurs lived in caves?

There is no evidence that any dinosaurs lived in caves. Fossil bones of dinosaurs and other prehistoric creatures have been found in caves, but these bones were washed into the caves after the dinosaurs had died.

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